MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

PMT0104 – FUNDAMENTAL MATHEMATICS I

(All sections / Groups)

19 OCTOBER 2018
9.00 a.m. – 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of **THREE (3)** printed pages including the cover page with 4 questions only.
2. Answer all **FOUR (4)** questions
3. Write all your answers in the answer booklet provided.
4. Only NON-PROGRAMMABLE calculator is allowed.

Question 1 (25 Marks)

a) Express the answer as a single polynomial.

$$6(2x^3 - x^2 + 2) - 3(x^3 - 4x - 1)$$ (3 marks)

b) Simplify and write the final answer in positive exponent.

$$\sqrt{\frac{27\,p^3q^{-5}}{3\,p^{-2}q^{-2}}}$$ (4 marks)

c) Solve the following in the lowest form.

$$\frac{\frac{2}{x+1}+\frac{1}{x+2}}{\frac{3x+5}{x^2+4x+4}}$$ (8 marks)

d) Write the expression in standard form $a + bi$.

$$\frac{2+\sqrt{-4}}{7+i}+\frac{4+5i}{1+\sqrt{-4}}$$ (10 marks)

Question 2 (25 Marks)

a) Solve for x if $\frac{3}{(x-2)}=\frac{3x}{2(x-2)}$. (3 marks)

b) Anne went to a bookstore to buy a textbook and a calculator. The textbook cost her RM83.50 and a calculator is RM94.50. Upon payment, she received a 10% discount on the calculator. Calculate the total payment of the items. (3 marks)

c) FOM planned to raise a charity sale. They want to sell t-shirts at a price of RM $(p+4)$. Assume that they managed to sell $(2p+7)$t-shirts and collected RM1500 from the sales,

i. Form a revenue equation in terms of p. Hence, show that the equation reduces to $2p^2+15p-1472=0$. (2 marks)

ii. From the equation in (i), solve for p. Round your answer to the nearest integer. (4 marks)

iii. From your answer in (ii), calculate the quantity of t-shirts sold. (2 marks)

d) Given the quadratic equation $4x^2 + 10x + 3 = 0$,

i. compute the discriminant of $b^2 - 4ac$. (2 marks)

ii. solve the equation by using quadratic formula. (3 marks)

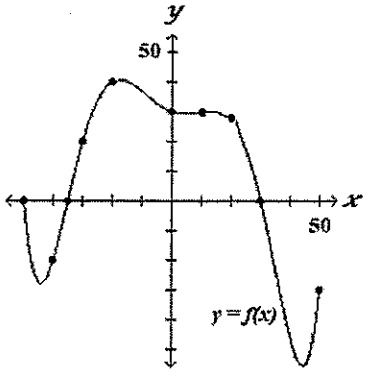
e) Solve for x and represent the answer on a **number line** and **interval notation**.

$$-12 \leq -3x + 1 \leq -4$$ (6 marks)

Continued...

Question 3 (25 Marks)

a) Consider the following graph



i. Find the intercepts. (2 marks)

ii. Estimate is the value of x when $f(x) = 20$? (1 mark)

iii. List the value(s) of $f(x)$ when $x < 0$. (2 marks)

b) Sketch the function by starting with basic graph. Show all the transformations.

$$f(x) = (x-2)^2 + 5$$ (8 marks)

c) Given $f(x) = 5 - x$ and $g(x) = \frac{2}{3x+1}$, find $(g \circ f)(6)$. (4 marks)

d) Find the remainder of the following polynomial by using given method

$$2x^5 - 2x^4 - 7x^3 - 9x^2 - 11x - 13 \text{ divided by } x - 3$$

i. Synthetic division (5 marks)

ii. Remainder Theorem (3 marks)

Question 4 (25 Marks)

a) Mr. Robert has been saving money in a bank on monthly basis. The first saving is RM150. Every saving of a month is twice of the previous month.

i. Calculate his saving on the 5th month. (2 marks)

ii. Compute the total saving that he has in one year. (2 marks)

b) The 5th term of an arithmetic sequence is 57 and the 15th term is 187. Find

i. common difference, d and first term, a_1. (6 marks)

ii. 99th term. (2 marks)

c) Find the sum of the first 20th terms for the geometric series of

$$7 + \frac{14}{3} + \frac{28}{9} + \ldots.$$ (3 marks)

d) From the given points of $M(-1,9)$ and $N(-2,8)$, find the

i. distance. (4 marks)

ii. slope. (2 marks)

iii. an equation of straight line connecting the two points. (4 marks)

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